

IN THE CLAIMS

Please amend the claims as follows.

Claims 1-21. (Canceled)

22. (Currently Amended) A component package fabricated by:

depositing an underfill material over a plurality of pads in a component-mounting area of a substrate, the underfill material comprising a filler material containing particles, ~~wherein the particles are distributed substantially uniformly throughout the underfill material;~~

placing a component on the component-mounting area, such that terminals of the component are aligned with corresponding pads and substantially enveloped in the underfill material, the particles potentially inhibiting a suitable connection between corresponding terminals and pads unless the particles are substantially removed; and

applying suitable pressure to cause the terminals to physically contact the pads and to remove most but not substantially all potentially inhibiting particles from between corresponding terminals and pads, with one or more particles being embedded in one of the terminals, in its corresponding pad, or in both the one terminal and its corresponding pad without preventing adequate physical and electrical contact.

23. (Previously Presented) The component package recited in claim 35 and fabricated such that the operations of applying suitable pressure and suitable heat are performed substantially concurrently by apparatus from the group comprising a thermocompression bonder, an ultrasonic bonder, and a component placement tool.

24. (Previously Presented) The component package recited in claim 35 and fabricated such that the pads are pre-coated with solder, and wherein, in applying suitable heat, the terminals become attached to the pads through the solder.

25. (Previously Presented) The component package recited in claim 35 and fabricated such that the terminals are pre-coated with solder, and wherein, in applying suitable heat, the terminals become attached to the pads through the solder.

26. (Previously Presented) The component package recited in claim 22, wherein the filler material is selected from the group consisting of silica, silicon oxide, silicon dioxide, silicon nitride, aluminum oxide, and aluminum nitride.

27. (Currently Amended) An electronic assembly comprising at least one integrated circuit (IC) package fabricated by:

depositing an underfill material over a plurality of pads in an IC mounting area of a substrate, the underfill material comprising a filler material containing particles, ~~wherein the particles are distributed substantially uniformly throughout the underfill material;~~

placing an IC on the IC mounting area, such that terminals of the IC are aligned with corresponding pads and substantially enveloped in the underfill material, the particles potentially inhibiting a suitable connection between corresponding terminals and pads unless the particles are substantially removed; and

applying suitable pressure to cause the terminals to physically contact the pads and to squeeze out most but not substantially all potentially inhibiting particles from between corresponding terminals and pads, with one or more particles being embedded in one of the terminals, in its corresponding pad, or in both the one terminal and its corresponding pad without preventing adequate physical and electrical contact.

28. (Previously Presented) The electronic assembly recited in claim 36 and fabricated such that the operations of applying suitable pressure and suitable heat are performed substantially concurrently by apparatus from the group comprising a thermocompression bonder, an ultrasonic bonder, and a component placement tool.

29. (Previously Presented) The electronic assembly recited in claim 36, wherein the underfill material comprises a filler material selected from the group consisting of silica, silicon oxide, silicon dioxide, silicon nitride, aluminum oxide, and aluminum nitride.

Claims 30-34. (Canceled)

35. (Previously Presented) The component package recited in claim 22, further fabricated by applying suitable heat to melt solder situated between the terminals and pads, which when cooled results in an electrical and mechanical connection between corresponding terminals and pads.

36. (Previously Presented) The electronic assembly recited in claim 27, further fabricated by applying suitable heat to melt solder situated between the terminals and pads, which when cooled results in an electrical and mechanical connection between corresponding terminals and pads.

37. (Currently Amended) An electronic assembly comprising:
at least one integrated circuit package having a plurality of terminals;
a substrate having a plurality of pads coupled to the plurality of terminals via a corresponding plurality of connections;
a hardened underfill encapsulating the terminals, pads, and connections; and
a plurality of particles in the underfill, ~~wherein the particles are distributed substantially uniformly throughout the underfill~~, wherein some of the particles are of such size and shape as to potentially inhibit suitable physical and electrical contact between corresponding terminals and pads if such particles remained in the connections, and wherein one or more particles are embedded in one of the terminals, in its corresponding pad, or in both the one terminal and its corresponding pad, but such one or more particles ~~any particles remaining in the connections~~ are of such size and shape that they do not prevent adequate physical and electrical contact between corresponding terminals and pads.

38. (Previously Presented) The electronic assembly recited in claim 37, wherein the particles have a size in the range of 0.05 microns to 40 microns.

39. (Previously Presented) The electronic assembly recited in claim 37, wherein the particles are substantially spherical.

40. (Previously Presented) The electronic assembly recited in claim 37, wherein the particles comprise material selected from the group consisting of silica, silicon oxide, silicon dioxide, silicon nitride, aluminum oxide, aluminum nitride, ceramic oxide, and ceramic nitride.

Claims 41-45. (Canceled)

46. (Previously Presented) The component package recited in claim 35, wherein the underfill material further comprises a fluxing agent, and wherein, in the operation of applying suitable heat, the fluxing agent cleans the terminals and the pads.

47. (Previously Presented) The component package recited in claim 36, wherein the underfill material further comprises a fluxing agent, and wherein, in the operation of applying suitable heat, the fluxing agent cleans the terminals and the pads.

48. (Currently Amended) An electronic assembly comprising:
at least one integrated circuit package having a plurality of terminals;
a substrate having a plurality of pads to be coupled to the plurality of terminals via a corresponding plurality of connections; and
an unhardened underfill covering the terminals and pads;
wherein the underfill, when heated, is to harden;
wherein the underfill, when hardened, is to have a coefficient of thermal expansion;
wherein the underfill comprises a plurality of particles to reduce the coefficient of thermal expansion;
~~wherein the particles are distributed substantially uniformly throughout the underfill;~~
wherein the particles are of such size and shape as to potentially inhibit suitable connections between corresponding terminals and pads;

wherein the terminals are to physically contact the pads, and wherein most but not substantially all of the particles are to be removed from between the terminals and the pads, when suitable pressure is applied to the package and/or the substrate, with one or more particles being embedded in one of the terminals, in its corresponding pad, or in both the one terminal and its corresponding pad without preventing adequate physical and electrical contact; and

wherein the underfill further comprises a fluxing agent to clean the terminals and pads when suitable heat is applied to the electronic assembly to connect the terminals and pads.

49. (Previously Presented) The electronic assembly recited in claim 48, wherein the particles have a size in the range of 0.05 microns to 40 microns.

50. (Previously Presented) The electronic assembly recited in claim 48, wherein the particles are substantially spherical.

51. (Previously Presented) The electronic assembly recited in claim 48, wherein the particles are selected from the group consisting of silica, silicon oxide, silicon dioxide, silicon nitride, aluminum oxide, aluminum nitride, ceramic oxide, and ceramic nitride.

52. (Previously Presented) The electronic assembly recited in claim 48, wherein the fluxing agent is selected from the group consisting of an organic carboxylic acid, a polymeric fluxing agent that has one or more carboxylic acid groups, an organic compound that contains one or more hydroxyl groups, or a mixture thereof.